

MISSISSIPPI SEVERE WEATHER PREPAREDNESS WEEK

February 4-8, 2013



Overview

Thanks for taking the time to read this Severe Weather Preparedness Week brochure for the state of Mississippi. When one looks at statistics for the number of tornadoes, strong to violent tornadoes, long track strong to violent tornadoes, and unfortunately tornado fatalities, the state of Mississippi ranks near or at the top in every category, especially after the year of 2011. These statistics show a long history of tornado impacts across the state.

This presents a preparedness challenge to the residents of Mississippi. Unlike the traditional tornado alley of the Great Plains, tornadoes are difficult to spot in Mississippi. Some of the reasons for this are poor visibility in the form of numerous trees in the state, the fact that many tornadoes in Mississippi are rain-wrapped, and that many Mississippi tornadoes occur at night. In addition, many homes and other buildings are not built as well as buildings in other parts of the country.

All these factors make it very important for residents of the Magnolia State to have multiple means of receiving severe weather warnings, have a shelter plan in place ahead of time, and take outlooks, watches and warnings seriously. These actions contribute to reducing injuries and fatalities.

When a tornado warning is issued for your area, be sure and get into a sturdy structure which can provide protection from flying debris. Get to the lowest floor, and put as many walls between you and the outside as possible, and protect your head. Get out of vehicles and mobile homes.

Mississippi Severe Weather Preparedness Week Events February 4 - February 8, 2013

Throughout the week, the National Weather Service will present educational material and conduct a tornado drill to help people prepare and protect themselves from tornadoes, damaging winds, hail, flash floods, and lightning. Each day of the week focuses on a specific type of severe weather, or on the warning and drill system.

- **Monday, February 4**, we will discuss Severe Thunderstorms. Large hail and damaging winds from severe thunderstorms are much more frequent than tornadoes in the south. These straight line winds can reach well over 100 miles an hour and can be devastating.
- **Tuesday, February 5**, we will draw attention to hazards of Flooding and Flash Floods. Flooding is the #1 cause of weather-related fatalities. Remember...Turn Around Don't Drown!
- **Wednesday, February 6**, will emphasize Tornado Safety. Over and over again, people survive tornadoes by knowing weather safety rules and by taking appropriate and timely action. A state-wide tornado drill will be conducted at **9:15am**. Schools, businesses and other agencies are encouraged to participate, with the goal of helping everyone learn life saving rules. Thursday will be the alternate drill day if adverse weather is expected on Wednesday.
- **Thursday, February 7**, will focus on lightning, often called the underrated killer. All thunderstorms have lightning and this hazard can be deceptively deadly.
- **Friday, February 8**, will focus on the methods of receiving severe weather warnings.

Mississippi SKYWARN®



SKYWARN® is the program developed by the National Weather Service to recruit and train storm spotters. SKYWARN® spotters enhance the National Weather Service's storm detection capabilities by identifying and reporting potentially dangerous weather conditions. The SKYWARN® program has become an invaluable link in the NWS warning process.

Despite all of the sophisticated technology used in a modern NWS office, forecasters still rely on storm spotters. Doppler radar may indicate that a storm may be producing large hail, damaging winds or even a tornado, but it cannot tell exactly what's happening on the ground underneath the storm. Storm spotters, trained by NWS meteorologists, act as the eyes and ears of the NWS. Their reports, radar data, and other information result in the most timely and accurate warnings possible.

SKYWARN® spotters across Mississippi come from all walks of life – law enforcement, fire or emergency management agencies and citizens interested in helping their communities. A large number of storm spotters are amateur radio operators, who volunteer their time and equipment to help the NWS detect and track severe storms.

Amateur radio operators, or "hams", will frequently operate radio equipment at the local NWS office, gathering reports from spotters in the field and relaying the data directly to NWS forecasters. SKYWARN® spotters are volunteers – they receive no compensation for their hard work. They do, however, have the satisfaction of knowing that their reports result in better warnings, which save lives. If you are not an amateur radio operator and still want to report information directly to the NWS, you can participate in the on-line spotter program. Go to <http://www.srh.noaa.gov/StormReport/SubmitReport.php?site=jan> for the Jackson area. Fill the last three letters in as **meg** for Memphis, **lix** for Slidell, and **mob** for Mobile if your area is served by another office (See Page 16 for map of service areas).

Who is Eligible?

The NWS encourages anyone with an interest in public service and access to communication, such as HAM radio, to join the SKYWARN® program. Volunteers include police and fire personnel, dispatchers, EMS workers, public utility workers and other concerned private citizens. Individuals affiliated with hospitals, schools, churches, nursing homes or who have a responsibility for protecting others are also encouraged to become a spotter.

How Can I Get Involved?

You can participate in the SKYWARN® program in your area by attending a storm spotter training class to become a trained spotter. Each of the training sessions is free, lasts around two hours and covers the following concepts:

- Basics of thunderstorm development
- Fundamentals of storm structure
- Identifying potential severe weather features
- Information to report
- How to report information
- Basic severe weather safety

Please contact one of the National Weather Service Offices listed below if you need more information about an upcoming SKYWARN® class.

Jackson.....	Steve Wilkinson.....	(601) 939-2786
Memphis, TN.....	Ben Schott.....	(901) 544-0411
Mobile, AL.....	Jeff Garmon.....	(251)-633-6443
Slidell, LA.....	Frank Revitte.....	(985) 649-0357

Here are links to Jackson, MS and surrounding National Weather Service office storm spotter training pages.

- WFO Jackson, MS: http://www.srh.noaa.gov/jan/?n=spotter_train_schd
- WFO Memphis, TN: http://www.srh.noaa.gov/meg/?n=skywarn_meetings
- WFO Mobile, AL: http://www.srh.noaa.gov/mob/?n=spotter_training

Severe Thunderstorms Monday, February 4, 2013



What is a Severe Thunderstorm?

A severe thunderstorm is a thunderstorm that produces one or more of the following: hail that has a diameter of one inch (quarter size) or larger, winds greater than or equal to 58 mph, and tornadoes. About 10% of all thunderstorms in the U.S. meet severe criteria.

Severe thunderstorms can occur at any time of year, although the most common time of occurrence is during the spring months of March, April, and May. In addition, pulse-type thunderstorms during the summer months can produce high winds, frequent lightning, and torrential downpours.

There is also a secondary season of organized severe weather in Mississippi, in November and early December.

What is the Difference between a Watch and a Warning?

A severe thunderstorm watch means that **conditions are favorable for severe thunderstorms to develop**. These are issued by the Storm Prediction Center in Norman, OK, typically before severe weather develops.

A severe thunderstorm warning means that a **severe thunderstorm has either been indicated on radar or witnessed by storm spotters**. Your local NWS Forecast Office issues severe thunderstorm warnings when severe weather is developing or occurring.



Hinds County - April 4, 2008
Photo By NWS Jackson, MS

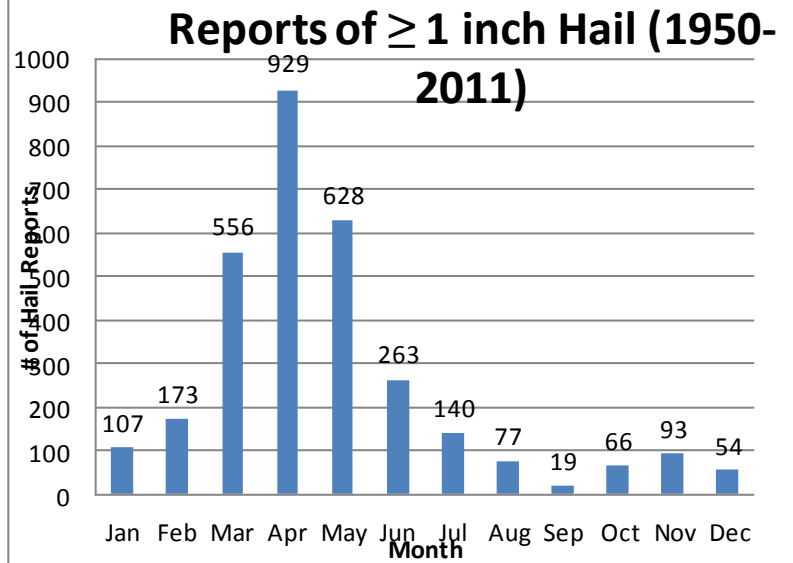
Safety Tips

- **Have a plan.** Prepare ahead of time so you and your family know what actions to take when severe weather occurs.
- **Get indoors!** There is no safe place outdoors during a thunderstorm.
- **Stay informed!** When severe weather threatens, stay tuned to NOAA Weather Radio, local television and radio stations, or the NWS homepage online at www.srh.noaa.gov/ for up to date information on the weather situation. Click on the office that serves your area.
- **Know what county you are in.** When a warning is issued, the threatened area will be identified by the counties that contain it.
- **Have a NOAA Weather Radio.** This is the best way to receive the latest and most up to date weather information from the National Weather Service.

Severe Thunderstorms—Hail Monday, February 4, 2013

How Is Hail Formed?

Hail is formed when water droplets are drawn into an area of strong upward moving air, known as an updraft, of a storm. Once the water droplets are transported above the freezing level, they combine with tiny airborne particles, such as dirt, salt, volcanic ash, etc., and freeze on contact, forming tiny ice particles. These ice particles are light enough that they remain suspended in the cloud, where they undergo processes that allow them to combine with other supercooled water droplets and grow into hail stones. Once the hail stones are heavy enough to overcome the upward force of the updraft, they fall out of the cloud. By definition, hail stones are 5 millimeters or larger, and can inflict significant damage to automobiles, buildings, crops, and even people.



1 inch or greater hail reports across MS since 1950

NWS Hail Criteria!

On January 5, 2010, the National Weather Service changed the severe hail criteria from 3/4 inch to 1 inch. There are a couple of reasons for this change. Research has shown that significant damage caused by hail does not occur until the hail diameter reaches one inch (approximately quarter size) or larger. Requests from NWS partners (emergency managers and the media) further prompted the decision to increase the "severe hail" criteria. They felt that frequent severe thunderstorm warnings for hail less than quarter size was desensitizing the public to these types of warnings, causing people to avoid taking action, which could lead to unnecessary damage or injury. Severe thunderstorm warnings for hail are issued less frequently as a result, placing greater emphasis on substantial hail threats.

The NWS will issue a **Special Weather Statement** under the (SPS) header when thunderstorms are expected to produce smaller than quarter sized hail for your county.



For more info visit: <http://www.weather.gov/oneinchhail/>

Hail Size Estimates

Pea.....	1/4 inch
Penny.....	3/4 inch
Quarter.....	1 inch
Half Dollar.....	1 1/4 inches
Golf Ball.....	1 3/4 inches
Tennis Ball.....	2 1/2 inches
Baseball.....	2 3/4 inches
Grapefruit.....	4 inches

Flooding and Flash Flooding are the #1 weather related killer!

Tuesday, February 5, 2013

FLASH FLOODING: Flash floods can occur within a few minutes or up to 6 hours after excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam or mud slide. Flash floods can wash out roads, destroy buildings and bridges. Because flash floods happen in a short period of time (less than six hours after the causative event) they are more life threatening than other types of flooding. Areas most susceptible to flash flooding are mountainous streams and rivers, urban areas, low-lying areas, storm drains, and culverts.

A Flash Flood Warning is issued when flash flooding has been reported or is imminent. It focuses on specific communities, creeks or streams, or other geographic areas where flooding is imminent or occurring.



RIVER FLOODING: This type of flooding is caused by an increased water level in established watercourses, such as a rivers, creeks, or streams. River flooding is slower to develop than flash flooding (more than 6 hours after the causative event), however, some smaller creeks and streams have a short lag time between the runoff from heavy rain and the onset of flooding. On the other hand, it may take several days for a flood crest to pass downstream points on major rivers such as the Lower Pearl, and Mississippi Rivers. The NWS issues River Flood Warnings when rivers are expected to rise above flood stage. Persons in the warned area are advised to take necessary precautions immediately. River stages and crest forecasts are given for selected forecast points along with known flood stages for each forecast point. While there is usually more advanced warning time with river floods than with flash floods, persons should be

familiar with the flood prone areas they live and work in, and must know what action to take and where to go if a flood occurs. Advance planning and preparation is essential.

FLOOD WATCHES: The NWS issues a Flood Watch when conditions are anticipated that could result in either flooding or flash flooding within a designated area. Persons in the watch area are advised to check flood action plans, keep informed, and be ready to take action if a warning is issued or flooding is observed.

FLOOD SAFETY RULES: Follow these tips to stay safe during flood conditions...

When a warning is issued get out of areas subject to flooding. These may include dips, low spots, stream beds, drainage ditches and culverts. If caught in low areas during flooding, go to high ground immediately.

Avoid already flooded and high velocity flow areas. A rapidly flowing stream or ditch can sweep you off your feet or even carry your car or truck downstream. Never drive through a flooded area as the road bed may be washed away. Play it safe! If you encounter a flooded road - TURN AROUND, DON'T DROWN!

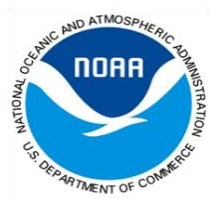


Be especially cautious at night when it is harder to recognize flood conditions, and never drive around a barricaded road.

Most flood deaths occur at night and when people become trapped in automobiles that stall in areas that are flooded. If your vehicle stalls, abandon it immediately and seek higher ground. The rising water may engulf the vehicle and the occupants inside. Do not camp or park your vehicle along streams or washes during threatening conditions.



When a FLOOD WARNING is issued for your area, act quickly to save yourself. You may only have seconds!



NWS Coordinating Dam Failure Notification Procedures



The near failure of the Lake Tangipahoa dam at Percy Quin State Park (Figure 1) during Hurricane Isaac last August brought public attention to what emergency officials are recognizing as a growing problem: the deteriorating condition of some of the older dams constructed many decades ago. As these dams age, they are under increased stress during periods of flooding, and subject to catastrophic failure which could cause serious flash flooding in downstream communities. The National Weather Service is responsible for issuing flash flood warnings in these situations whenever notified of an imminent dam failure. In order to guarantee that all responsible parties are using the same guidelines with regard to dam safety and notification procedures, the NWS has been working closely with the US Geological Survey, the US Army Corps of Engineers, state dam safety officials with the Mississippi Department of Environmental Quality, and emergency management officials to develop common terminology and protocols to handle any future dam break situations. This will help ensure the most effective communication possible in getting the word out when notifying affected communities of a potential dam failure, a situation in which seconds count in saving lives. If you live in an area subject to flooding from dam failure, you should ensure you have a way of receiving flash flood warnings from the NWS, even in the middle of the night when you may be asleep.



Figure 1. Slide in the middle of the dam at Percy Quin State Park.

Tornadoes

Wednesday, February 6, 2013



EF-5 Tornado in NE Neshoba County on April 27, 2011 (*Tornadovideos.net*)

What is a Tornado?

A tornado is a violently rotating column of air that extends from the base of a storm cloud to the ground. Some conditions that are conducive for tornado formation include warm, moist, unstable air, strong atmospheric winds that increase in speed and change direction with height, and a forcing mechanism to lift the air. When a combination of these factors comes together just right, tornadoes form. The most common time of year for tornado formation in Mississippi is during the spring months of March, April, and May, with a secondary tornado season in November. Additionally, the afternoon and evening hours are the times of day at which most tornadoes occur, as they are the times at which the maximum heating takes place. However, tornadoes can occur at any time of day, and at any point during the year, given the right environment. Many tornadoes occur at night in Mississippi (see below)

Nighttime Tornadoes Pose Greater Danger

The NWS would like to draw attention to nighttime tornadoes. These tornadoes pose a greater danger than those that occur during the daylight because once most people go to bed, they are no longer connected to the watches or warnings issued by the NWS. Also at night, visibility is reduced and observing a tornado is more difficult. This is elevated during the winter months because it is not the traditional tornado season. Research by Gagan et al. 2010 compared tornado statistics from the Great Plains in the classic "Tornado Alley" to tornadoes in the Deep South or "Dixie Alley." Researchers found that Dixie Alley had far greater amounts of Killer Strong/Violent Tornadoes between 9pm-9am timeframe. Dixie Alley had nearly twice the number of strong/violent tornadoes from Midnight-Noon timeframe than Tornado Alley from 1950-2007.



Large tornado striking a transformer near Leaksville, MS on April 15th, 2011 (*Tornadovideos.net*)

Having an properly programmed **All Hazards NOAA Weather Radio** with S.A.M.E. County Coding technology will alarm individuals anytime of day when a severe thunderstorm warning or tornado warning is issued for their county.

Enhanced Fujita Scale (EF Scale)

EF Rating	Wind Speeds	Potential Damage Threats
EF 0 (weak)	65-85 mph	Light damage, shallow rooted trees pushed over, some damage to gutters or siding.
EF 1 (weak)	86-110 mph	Moderate damage, mobile homes overturned, roof surfaces peeled off.
EF 2 (strong)	111-135 mph	Considerable damage, large trees uprooted or snapped, mobile homes destroyed.
EF 3 (strong)	136-165 mph	Severe damage, trains overturned, well built homes lose roofs and walls.
EF 4 (violent)	166-200 mph	Devastating damage, well built homes leveled, cars thrown.
EF 5 (extreme)	Over 200 mph	Incredible damage, well built homes disintegrated, automobile-sized objects thrown >300ft.



Tornado Safety Tips!



When a tornado warning is issued:

- Get inside a sturdy, well built structure.
- Get on the lowest floor and in an interior room such as a hall, closet or bathroom. Get in a room that does not have any windows.
- Use something to protect your head such as a helmet, blankets, mattresses, pillows, cushions. Use something that will provide more protection than just your hands.
- If you are in a car: do not try to outrun a tornado. Take shelter in a sturdy building nearby. If none is available, get out of the car and get into the lowest part of the ground such as a ditch.
- Never take shelter under highway overpasses. Many are not constructed properly to provide adequate shelter, especially as the wind speeds increase as the tornado passes over.
- Mobile homes are not safe shelters. Plan to take shelter in a more sturdy building nearby or if no other shelter is available, get low to the ground in a ditch.
- For those in schools, nursing homes, hospitals, airports and shopping centers: take shelter in the designated shelter area. Stay away from large windows or glassed areas. Stay away from large rooms like dining halls, gymnasiums or warehouses because they have weakly supported roofs.

Develop a tornado safety plan **ahead of time**! Do not wait until the tornado is on your doorstep to figure out where to go, or what to do. Tornadoes form very quickly and may occur with little advance warning. You may only have a few seconds to find shelter, so it is important to know where to go and move quickly.



Outside walls of a home collapsed after being struck by a tornado. Interior walls remain standing (above). A 2x6 piece of wood through a refrigerator (left). Both of these photos show why being in the interior portion of a home/building is important, and why wearing a helmet is a good idea!

DRILL DAY
Wednesday, February 6, 2013
9:15 Local Time

A TORNADO DRILL will be conducted Wednesday morning, February 6, 2013, at 9:15 AM **Local Time**, weather permitting, as part of SEVERE WEATHER PREPAREDNESS WEEK in Mississippi. *If Wednesday's weather is inclement, the test will be Thursday, February 7, 2013 (same time).*

The message will be sent under the Routine Weekly Test Product (RWT) disseminated by NOAA Weather Radio only. Many weather radios will alert for this test but some models will just flash a light. If your weather radio does not give an audible alert at 9:15 am, proceed with your drill anyway.

The Weekly Test Product, with the tornado drill message, will be broadcast on all NOAA Weather Radio Transmitters across Mississippi.

A Drill such as this gives schools, churches, business offices and plant safety managers across the state a chance to check the readiness of their Severe Weather Safety plans. If your office has a plan already in place, test it to make sure your employees know how to respond properly. If your employees know how the safety procedures work, they can carry them out effectively when the time comes.

IF YOUR WORK PLACE, SCHOOL OR CHURCH DOES NOT HAVE A SAFETY PLAN, NOW IS THE TIME TO START ONE!! Developing a safety plan is not difficult. If a plan is easy to operate, it is more likely to be successful when needed. Countless lives are saved each year by planning, preparedness and proper education. The U.S. population has grown in recent years, yet the number of tornado deaths has diminished. This is due to agencies and individuals developing Weather Safety Plans and to people reacting in a prudent manner when severe weather threatens their areas.

**YOUR SAFETY AND THAT OF YOUR FAMILY, FRIENDS AND
CO-WORKERS DEPENDS ON YOU!!**

Graphical Tornado Database!

Have you ever wanted to look back at historic data to see when and where tornadoes occurred, and what their impacts were? The National Weather Service offices in Memphis and Jackson have developed easy to use, interactive tornado databases that can display tornado data going all the way back to 1880! **Figure 1** shows an example of the April 24, 2010 tornado that tracked nearly 150 miles across central Mississippi, and the impacts it had on our state. Check it out today!

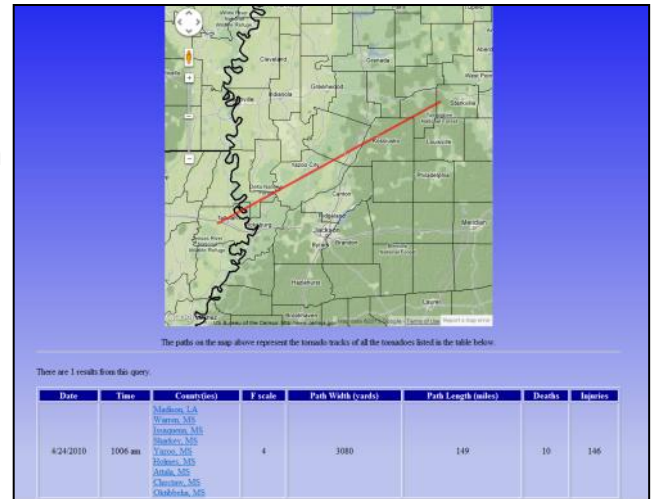
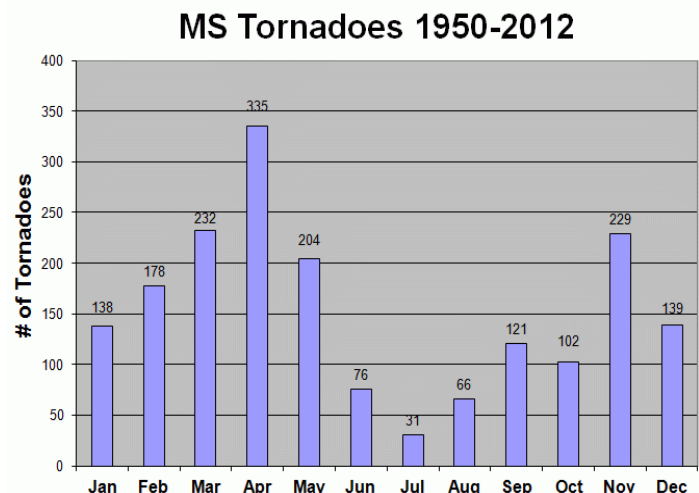
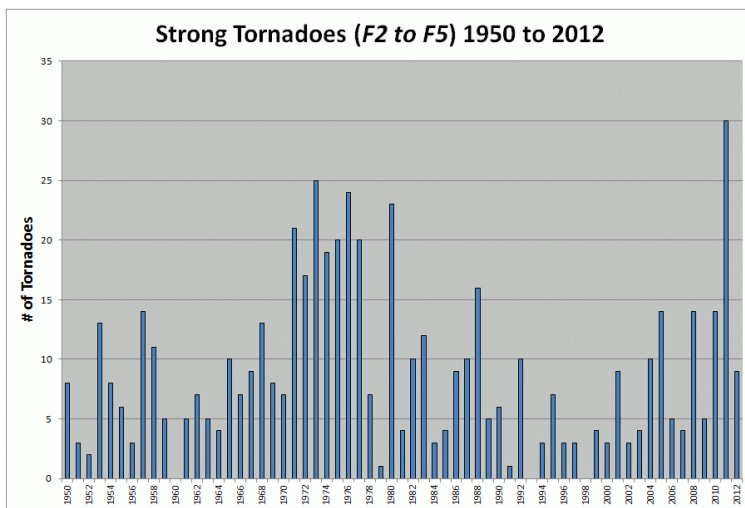
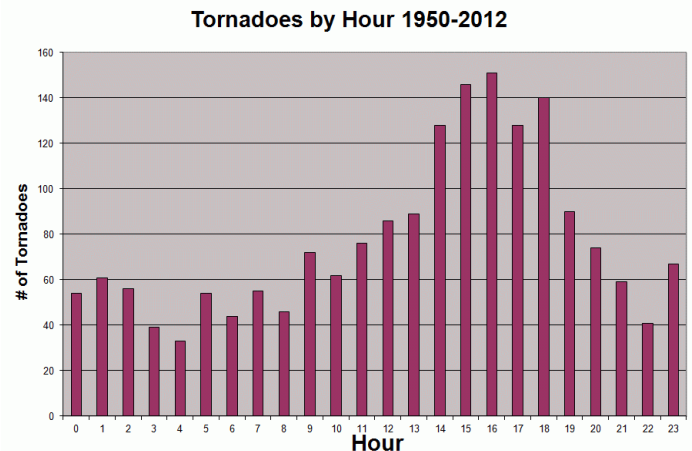
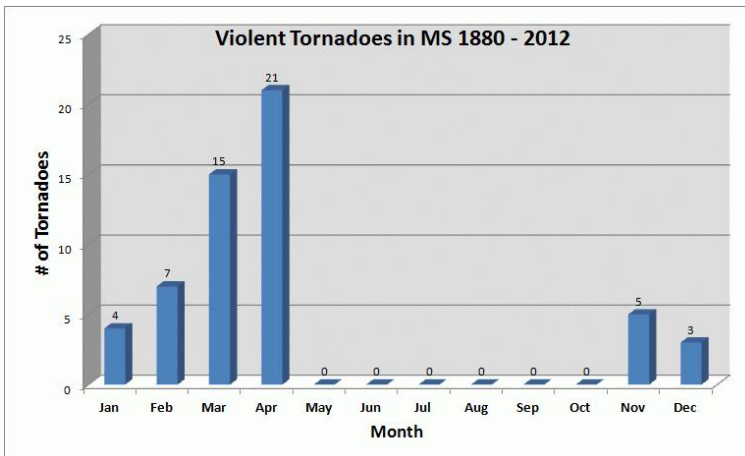


Figure 1. Example output from the Graphical Tornado Database.

To access these databases, go to the following web links:

Memphis (northern MS) – <http://www.midsouthtornadoes.msstate.edu/>

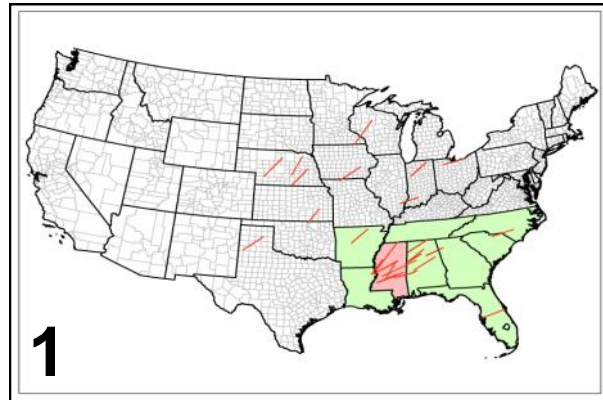
Jackson (central and southern MS) - <http://www.midsouthtornadoes.msstate.edu/jan/>



History of Violent, Long Track Tornadoes in Mississippi

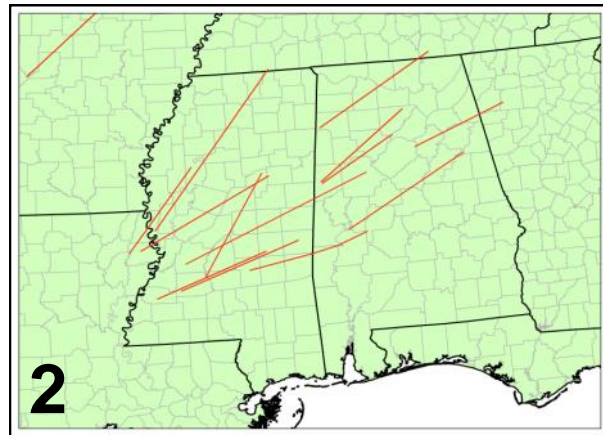
By Jared Allen– NWS Jackson, MS

Throughout history, the Southeastern United States, and namely Mississippi, has been prone to violent (EF4 or EF5), long-track (100 Miles+) tornadoes. Since 1950, when the official tornado database began, a total of **26** violent, long-track tornadoes have occurred across the United States (Figure 1).



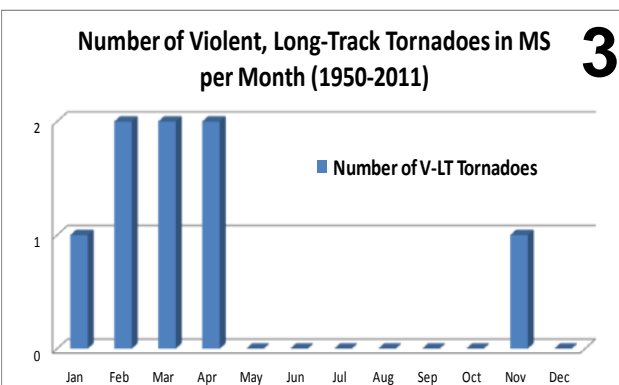
The southeast (highlighted in green) accounts for **16 (~62%)** of the total violent, long-track tornadoes. Even more frightening, the state of Mississippi (highlighted in red) has experienced **8 (31%)** of the nation's total violent, long-track tornadoes (Figure 2). These eight violent, long-track tornadoes shown impacting Mississippi in Figure 2 resulted in 224 fatalities and an estimated 2,375 injuries. These figures average out to 28 fatalities and nearly 297 injuries per violent, long-track tornado in Mississippi. However, with heightened awareness, better technology, and increased lead times, the last two violent, long-track tornadoes (2010, 2011) combined for a total of 17 fatalities and 268 injuries. Mississippi is the only state to have back to back years in which a violent, long-track tornado occurred. The largest official fatality count of the eight is 58, which occurred twice, nearly 5 years apart, in 1966 and 1971. Unfortunately, Mississippi has three of the top ten deadliest tornadoes to strike the entire United States before the official tornado database began with Natchez (317 fatal), Tupelo (216 fatal), and Purvis (143 fatal), ranking 2nd, 4th, and 7th respectively.

- Figure 1: Violent, Long Track Tornado Paths from 1950-2011.



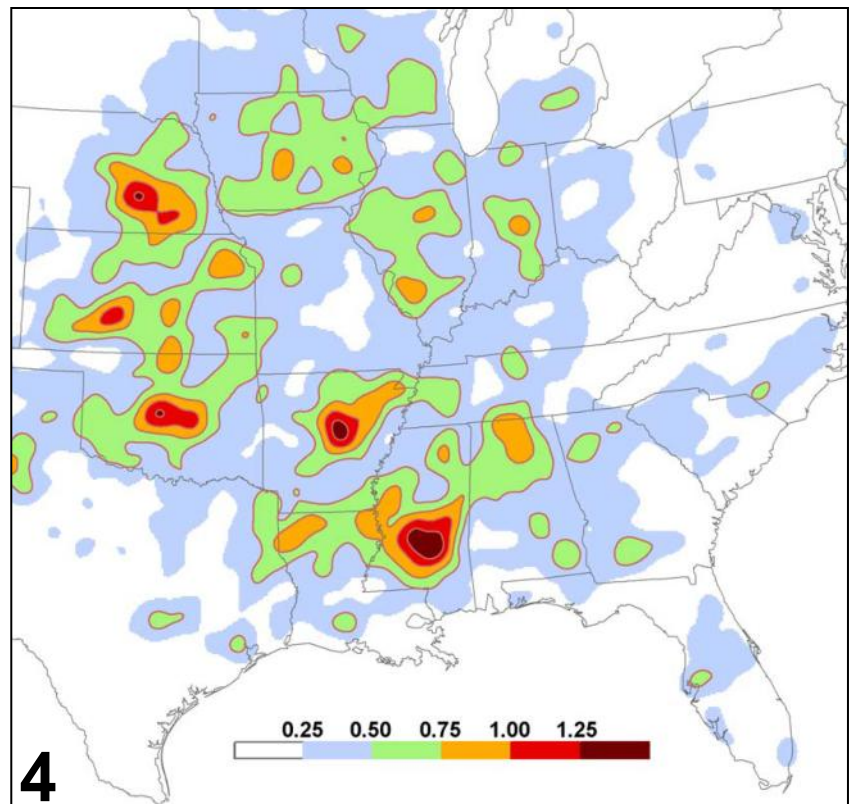
Historically, violent and long-track tornadoes have occurred over a range of months from November through April (Figure 3). Interestingly, the tornado that struck Purvis in 1908 and the violent, long-track tornado in 2010 occurred on the same day, April 24th. New research analyzing all historical tornado paths since 1950 has shown Mississippi, and especially Smith County, to have the greatest probability of experiencing **any** tornado within a given year (Figure 4, Dixon et al.). A large area of central Mississippi and portions of northern Louisiana and Arkansas are equal to, if not greater than areas out in "Tornado Alley." On average, south-central MS will be impacted by at least one tornado in a given year with a greater likelihood of experiencing a violent and long-track tornado.

- Figure 2: Violent, Long-track Tornadoes across MS and AL from 1950-2011.



- Figure 3: Number of Violent, Long-track Tornadoes per Month in Mississippi from 1950-2010.

- Figure 4 (Right): Average Annual Tornadoes within 25 Miles of a point.



Tornado Appearance...Not All the Same



1 Mile Wide EF4 Wedge Tornado near Yazoo City, MS April 24th, 2010. Could be mistaken for a rain shield or low clouds.



Skinnier but still strong EF2 Tornado near Possumneck, MS on April 15th, 2011.



1 Mile Wide EF3 Wedge Tornado near Scooba, MS April 15th, 2011. This too can be mistaken for low clouds. Be sure to look for rotation.



Looks well-defined and possibly a strong tornado, but was only a EF0 tornado that spun up from Hurricane Gustav in September 2008 in Franklin County MS.

Tornado Emergency



What Does It Mean? Here is the criteria for a Tornado Emergency:

- 1) Report of significant damage or a reliable report (from a trained spotter) of a large tornado on the ground
- 2) Radar showing strong indications of a strong/violent tornado (debris ball)
- 3) Environmental conditions support strong/violent tornadoes and/or PDS tornado watch is in effect



Severe Weather Climatology Loops

Patrick Marsh, a Ph.D. candidate at the University of Oklahoma, has created interesting severe weather climatology loops of phenomena such as EF-2 or greater tornadoes, 64 mph wind gusts, and 1 inch hail. The loops are available on his personal website located here:

<http://www.patricktmarsh.com/2012/11/climatological-estimates-and-evolution-of-local-daily-severe-weather-probabilities-part-2/>



Tornado Sirens

How effective are they at warning the public?

Steve Wilkinson — NWS Jackson, MS



Tornado sirens have long been a method of warning people of approaching tornadoes. But is a siren the most effective means of communicating information to the public?

Let's start with the positives of sirens. See **Figure 1**, which shows most of the siren locations across Mississippi. There are numerous tornado sirens across the state of Mississippi, which cover much of the population in the larger cities and towns. For those that hear the sirens, they can be an effective means of mass notification in a highly populated area. They give the population an initial warning to either take shelter or seek more severe weather information through means such as television and/or the internet.

However, did you know that sirens are meant to be an outdoor warning system? Unless the siren is located in your back yard, you are not likely to hear it inside your house due to household noises and the housing materials that block sound. In addition, when there is thunder, high wind, and heavy rain in the area, they further reduce the range and effectiveness of the siren. Finally, many locations in the state (reference Figure 1 again) do not have siren coverage. Thus, many people who think they have a siren to notify them of an approaching tornado get no warning from a siren when the tornado hits their area.

The National Weather Service and MEMA recommend that residents purchase a programmable NOAA Weather Radio, which is essentially a siren inside your house. The radio will alert you when tornado warnings are issued and you can still turn to television or the internet for a visual. There are also many ways to receive alerts through cell phones and other computer devices. But don't take too long to seek a second source of information. Seconds could save your life when a tornado is approaching!

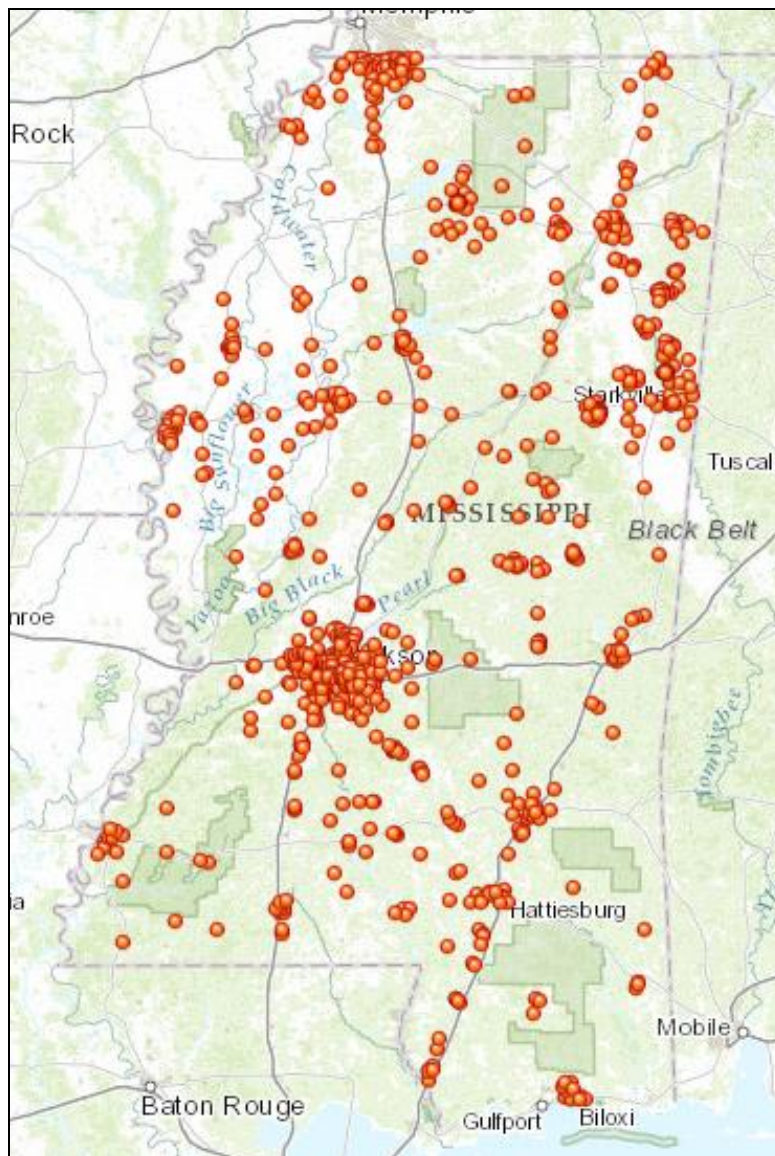


Figure 1. Siren locations (red dots) across the state of Mississippi.

Lightning

The Underrated Killer

Thursday, February 7, 2013



EVERY THUNDERSTORM CONTAINS LIGHTNING.

In 2012, 28 people were killed by lightning. Since 1959 a staggering 3919 people have lost their lives as a direct result of being struck. In an average year around 25 million lightning strikes are recorded across the United State alone. Worldwide there are around 1800 thunderstorms ongoing at any given time. Lightning is an incredibly powerful electrical discharge, containing up to 100 million volts of electrical charge and capable of reaching 50,000 degrees Fahrenheit. Cloud to Ground Lightning is the result of incredible differences in electrical charge which forms within thunderstorms...as well as between thunderstorms and the earth's surface. Recent science suggests that ice in thunderstorms is key to creating the massive charge differences which lead to lightning.

Thunderstorm updrafts and downdrafts work to separate smaller ice particles from larger hail stones within the storm. As this happens many of the ice pieces collide resulting in a separation of electrical charge. The higher part of the storm contains primarily positively charged small ice crystals, with negative charged larger chunks of ice down low. As the storm moves across the earth a pool of positively charged particles gathers near the ground. Eventually a brief electrical circuit is created as a negatively charged "step leader" descends from the storm toward the ground and eventually connects to the positive charge on the ground. The extreme heating of the air with lightning causes a rapid expansion of the air around it, leading to thunder. The sound of thunder will travel away from lightning at a speed around 1 mile every 5 seconds. If you can see lightning and hear thunder at your location you are not safe, if you hear thunder within 30 seconds after seeing lightning your life is in immediate danger.

Lightning Safety Rules—Outdoors

- **Seek shelter** inside a house, large building or an all metal vehicle with the windows rolled up (avoid convertibles).
- **If your hair stands on end and your skin tingles... lightning is about to strike. Take cover immediately!**
- When boating, head for shore and get into a shelter, or vehicle. If caught in a boat, lie down in the boat with cushions between you and the boat's side and bottom.

AVOID

- Large trees, hilltops and other high places.
- Chain link fences and any other metal fences like those around ball parks and play grounds.
- Motorcycles, scooters, golf carts, small metal sheds, bicycles, tractors and farm equipment that does not have an enclosed metal cab.



An oil tank exploded and flew over 100 yards after being struck by lightning.
Photograph by Jeff Galloway

Lightning Safety Rules - Indoors

- **Stay away from windows.** Avoid telephones and electrical appliances (wires connecting to these devices run outside of the home and act as lightning rods). Don't wash dishes or take a shower. The pipes will conduct electricity.
- **Unplug computers** and other sensitive electrical devices (time permitting) since surge suppressors may not protect these items if lightning hits close to the home.
- **Remember, there is no truth to the old myth that "lightning never strikes twice."**
- Take time this week to learn or refresh your memory on lightning safety rules. That quick dash out in the open when a thunderstorm is in progress may unnecessarily expose you to the possibility of being struck. It is not worth the risk.
- **If a person is struck by lightning, there is no residual charge left on the body. The quick application of CPR may maintain vital body functions until medical help can be obtained.**

Friday February 8, 2013

NOAA Weather Radio / Emergency Alert System / Wireless Emergency Alerts

The National Weather Service (NWS) utilizes NOAA Weather Radio All-Hazards to broadcast continuous weather information 24 hours a day, every day of the year. This is your direct link in receiving watches and warnings from the NWS. When properly programmed, with options for single or multiple counties, the NOAA weather radio will alert you of a warning for your area, day or night. With battery back-up, the radio will still be able to deliver life-saving information even if the power goes out due to the storms. The state of Mississippi is served by 16 NOAA Weather Radio (NWR) transmitters with several more surrounding transmitters in neighboring States covering additional counties and parishes. Approximately 95 percent of the people in Mississippi are within range of a NWR transmitter (see list of NWR transmitter locations and frequencies in table below).

While routine programming offers the latest forecasts, hazardous weather outlooks, current weather conditions, and official climate data, **the broadcast cycle** is automatically updated and **at times interrupted whenever a specific weather watch, warning, or advisory is issued by an NWS Forecast Office**. Watches, warnings, advisories and special weather statements are given the highest priority on NWR and are frequently updated with critical weather information.

In an emergency, each station will transmit a warning alarm tone in addition to the SAME (Specific Area Message Encoding) tone. Information on the emergency situation then follows. These alert tones, especially the SAME, are capable of activating specially-designed receivers by producing a visual and/or audible alarm. Not all weather band receivers have this capability, but all radios that receive the NWR transmission can receive the emergency broadcasts. The warning alarms and SAME tones are **tested each Wednesday, typically between 11AM and Noon, weather permitting**.

Commercial radio and television stations, as well as cable television companies, are encouraged to use NOAA Weather Radio in order to rebroadcast pertinent weather information to the general public. NWR is also a major part of the Emergency Alert System (EAS), hence the "All-Hazards" tag, with improved technology to efficiently process critical weather warning information through commercial broadcast outlets in order to save your life.

Wireless Emergency Alerts (WEA) are another avenue for government agencies to send urgent messages directly to cell phones in an area of interest. Applications or additional software are not needed, and the messages will look similar to text messages when they arrive on your phone. Additional information on WEA can be found at <http://www.nws.noaa.gov/com/weatherreadynation/wea.html#faq1>.

Locations and Frequencies of NOAA Weather Radio Stations Serving Mississippi

Leakesville, MS	162.425	Baton Rouge, LA	162.400
Gulfport, MS	162.400	Memphis, TN	162.475
Oxford, MS	162.550	Fountain Hill, AR	162.475
Inverness, MS	162.425	Marvell, AR	162.525
Ackerman, MS	162.475	Bogalusa, LA	162.525
Booneville, MS	162.400	Alexandria, LA	162.475
Rose Hill, MS	162.550	Florence, AL	162.475
Jackson, MS	162.400	Winfield, AL	162.525
Bassfield, MS	162.475	Mobile, AL	162.550
Bude, MS	162.550	Demopolis, AL	162.475
Carthage, MS	162.500	New Orleans, LA	162.550



NWS Mississippi StormReady Program



The National Weather Service (NWS), in partnership with local emergency management, law enforcement, and local government agencies, works to protect the public they serve from the hazards of severe weather through the StormReady program. The StormReady program facilitates protection of the public through severe weather planning, public education, and awareness campaigns. When the public is better informed of the threats from severe weather – lives are saved. It is the goal of all StormReady participants to maximize the protection of life and property by ensuring the public is properly prepared and promptly warned when severe weather is expected or occurring.

The StormReady program incorporates several requirements that participating agencies must adhere to that help mitigate threats from hazardous weather. These include: (1) establishing a 24 hour Warning Point and Emergency Operations Center; (2) having multiple ways of receiving severe weather warnings and forecasts to alert the public; (3) creating a system that monitors weather conditions locally; (4) local means of warning dissemination; and (5) developing a hazardous weather plan that includes severe weather spotter training and emergency training exercises. Considering that greater than 90% of federal disasters are weather related, it's imperative that severe weather education in local communities remain a top priority. This ensures the public is prepared to protect themselves from the dangers of severe weather.

The National Weather Service is starting a program that will be working with critical facilities across the state in pursuit of StormReady recognition. These facilities include hospitals, schools and other critical facilities that require an efficient severe weather plan to protect life. This initiative will help administrators of these facilities ensure they have an efficient, well thought out plan when severe weather threatens.

The National Weather Service tirelessly promotes this worthwhile program and recruits new participants through its local warning coordination/outreach program. The NWS encourages any agency interested in becoming StormReady to contact their local NWS office. For additional information, detailed requirements, and program benefits, please visit: <http://www.stormready.noaa.gov/>. Working together, we all can do our part to protect the citizens of Mississippi from the dangers of hazardous weather.



Figure 1. Counties (highlighted), cities and other agencies recognized as StormReady.

Power Up – Tips from *Energizer* to Help Weather the Weather

To make sure you have the power you need during and after severe weather, be sure to include a Keep Safe. Keep Going® power kit with your other emergency kit materials.

- Battery-powered radio or crank radio to keep your family apprised of current weather-related news.
- Plenty of extra batteries. (AA, AAA, C, D) provide long-lasting power before, during and after the storm. Lithium batteries have a long storage life, perform well in extreme temperatures and are perfect for use in LED flashlights and other high-tech devices.
- Flashlight for every member of the family. Use flashlights instead of candles when the power goes out.
- Battery-powered cell phone charger.
- Extra specialty batteries to power critical health devices like hearing aids and blood glucose monitors.

For Your Information

This booklet contains materials useful during the Severe Weather Preparedness Week campaign and at other times, too. You are invited to contact the National Weather Service, state and county emergency management agencies for interviews and for answers to your questions. National Weather Service personnel and local emergency management are available for weather awareness programs to civic and industrial organizations, schools, hospitals, and others interested in weather safety.

Each county in Mississippi is served by a designated National Weather Service Office as identified below:

Please contact one of the Offices listed below if you need more information.

Jackson.....	Steve Wilkinson.....	(601) 939-2786
Jackson.....	Alan Gerard.....	(601) 939-2786
Memphis, TN.....	Ben Schott.....	(901) 544-0411
Memphis, TN.....	Jim Belles.....	(901) 544-0411
Slidell, LA.....	Frank Revitte.....	(985) 649-0357
Slidell, LA.....	Ken Graham.....	(985) 649-0357
Mobile, AL.....	Jeff Garmon.....	(251) 633-6443
Mobile, AL.....	Jeffery Cupo.....	(251) 633-6443
Mississippi Emergency Management Agency.....		(866) 519-6362

Information Resources on the World Wide Web

For additional resources, the following web sites are available:

NWS Jackson: www.srh.noaa.gov/jan
NWS Memphis: www.srh.noaa.gov/meg
NWS New Orleans: www.srh.noaa.gov/lix
NWS Mobile: www.srh.noaa.gov/mob



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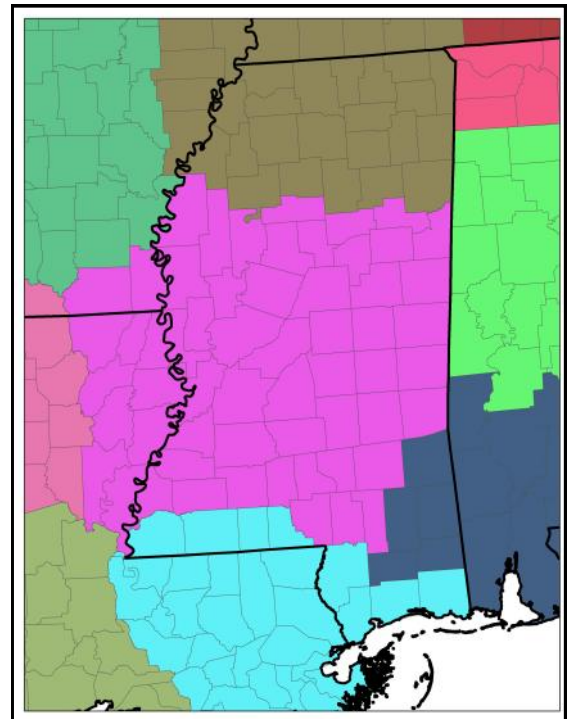
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All NWS Offices:

<http://www.weather.gov>



Legend: Jackson | Memphis, TN | Slidell, LA | Mobile, AL